PowerNet 5250

Reference Manual

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1 5250 Connectivity Overview

Introduction

When equipped with the 5250 Connectivity Package, the PowerNet provides connectivity between Spectrum One LANs and/or access point LANs and a 5250 host. Four types of 5250 connectivity packages are available: SNA/SDLC V.35, SNA/SDLC V.24, TN5250/Ethernet, and TN5250/Token Ring. During system operation, the wireless terminals appear to the host as 5251 Model 11 terminals, while the PowerNet appears as a 5294-1 cluster controller. This *5250 Reference Manual* describes the procedures necessary to install and support connections to the 5250 Host. An SNA/SDLC environment, using V.24 and V.35 connectivity, is discussed as well as the TN5250 environment.

Features

The 5250 Connectivity Package offers the following:

- Easy Setup - On-line forms are used to enter information for system setup. This process is completed from within the program. There are no files to edit or command line operations to perform.

- *Quick Start* or *Script* Operation - The *Quick Start* mode and its default *5250 Handler* allow system use without customization. Scripting allows for even more efficient use with complete customization of keystrokes, host logon/logoff procedures, application use, and more.

- Logs and Traces - These features help tune the system during setup and also resolve problems if and when they occur. Log levels may be set to collect various degrees of information, or none, during normal operation.

- Easy Terminal Menu Modification - Add hosts or applications to the RF terminal *Host List Menu* easily. Use the PowerNet *Host List* option and the *5250 Handler* for additions and/or modifications to this menu.

- Full Screen Emulator - A 5250 terminal emulator is available as a convenient menu selection.

- Screen Formatter Compatible - The Screen Formatter package allows customization of full-size host screens to smaller RF terminal screens. Although purchased separately, it is fully integrated with this package in both operation and function.

- Variable PU Limit - By default, the system is set for a maximum of 16 PUs with each PU supporting 8 LUs. The actual number of terminals that can be supported is determined by other factors discussed later in this document.

Menus

Modifications to the PowerNet base menus, shown in the *PowerNetIX Reference Manual*, include two additions to the *Operations Menu* following the *Startup RF Network* selection. These additions are either *SDLC Startup* and *SDLC Shutdown*, or *TCP/IP* (depending on the package installed).

A modification to the PowerNet *Main Menu* is the addition of either the *SDLC Network Menu* or the *TCP/IP Network Menu* which appears after the *RF Network Menu*.

Documentation

Instructions for setting up host connection parameters and checking connection status appear first. Modification of the *Host List* file which involves the 5250 Handler is next followed by log examination. After these configurations are in place, the system can be used in *Quick Start* mode.

Customization of the system, by using scripts to automate a variety of terminal operations, is documented in Chapter 4. Scripts, which are created with the custom Dialog Language, are not absolutely necessary but help streamline operation. For example, terminal *logon* and *logoff* procedures can be added to the script, thus removing them from the operator's responsibilities. The full screen emulator, discussed in Chapter 3, can be useful during script development.

Information regarding the networks/hardware in place at the installation site is needed when reading and following the material in this manual. The Host System Administrator should be able to provide this. In addition, readers may find a background in the host network and SNA/SDLC or TCP/IP protocols to be helpful.

Conventions

This document uses the same typographical conventions as the *PowerNet IX Reference Manual*.

Interface

Please see the *PowerNet IX Reference Manual* for information about the screen formats and keys used with this software.

Product Information

The *5250 Reference Package* for PowerNet is designed to operate with RF terminals that include a 5250 keypad overlay. The product numbers for these items are listed below.

Product #	Description
NCU2064-3213	5250 SNA/SDLC RS-232 Connectivity Package
NCU2064-3214	5250 SNA/SDLC V.35 Connectivity Package
NCU2064-3502	Screen Formatter Software Package
NCU2064-3115	TN5250 Ethernet Connectivity Package
NCU2064-3116	TN5250 Token Ring Connectivity Package
3310-NMCHCP8	PRC 3310 with 5250 Keypad Overlay
3910-NM0P048	VRC 3910 with 5250 Keypad Overlay
3800-NMRE063	46-key LRT 3800 Standard Range w/ 5250 Keypad Overlay
3800-NMREL63	46-key LRT 3800 Long Range w/ 5250 Keypad Overlay

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2 Host Connection Setup

Introduction

This chapter describes the procedures required to set up the communication link between a PowerNet server and a 5250 host. Since SNA/SDLC, and TN5250 connectivity setup is similar, one set of instructions is given. Differences in setups are documented. Menus are almost identical, with differences indicating either SDLC, or TN. Examples of menus are included.

If Token Ring connectivity is being implemented, one additional step must be taken—to determine whether the TR network is operating at 4 or 16 Mbps. If it is 16 Mbps, no additional work must be performed, other than the steps listed in the summary below. If the network is operating at 4 Mbps, a DIP switch on the Token Ring NIC must be changed. Please see *Token Ring NIC* on page 2-3 for instructions.

If TN5250 is implemented, host connection setup must be completed prior to setting up the TN5250 handlers. Details for this host connection setup and configuration is covered in the TCP/IP setup manual.

The following is a summary of the link setup process:

- Shut Down Host Link - Terminate any activity between the host and PowerNet.

- Set Host Parameters - Complete the on-line setup form with the parameters obtained from the host system administrator.

- Set Up Physical Connection - Connect all hardware, connectors, cables, etc., as required, for the link from the PowerNet server to the host.

- Start Up Host Link - Activate the connection between the 5250 host and PowerNet.

- Verify Link - Display status screens for checking the communication path between the PowerNet server and the 5250 host.

Hardware

System administrator's or the end users' services are responsible for all equipment and cabling *external* to the SDLC board, Token Ring NIC, or Ethernet connection, which can include synchronous modems, modem eliminators, modem sharing units, MAU cables, HUBs, etc. All the necessary equipment and its configuration in each of these environments is specific to the host and site requirements for each installation. Therefore, the hardware connections for each site must be made on an individual basis. Only general information is given here.

SDLC Communications Board

Each SNA/SDLC communications board has two, high density D-subminiature female port connectors. The cables have a DB-15 male connector on the board end and a DB-25 male connector on the peripheral end. Pinouts for each connector are as follows:

CAUTION: *Although the connectors on the SDLC board look like a VGA monitor connection or a multiport concentrator connection, **do not** plug any devices other than the SDLC adapter cable into this board.*

DB-15 Pin NumberAssignment

1	Not Connected	
2	Transmitted Data (TXD)	Output
3	Received Data (RXD)	Input
4	Request To Send (RTS)	Output
5	Clear To Send (CTS)	Input
6	Data Set Ready (DSR)	Input
7	Signal Ground	
8	Data Carrier Detect (DCD)	Input
12	Receive Clock (RXC)	Input
13	Transmit Clock (TXC)	Output
14	Transmit Clock (TXC)	Input
15	Data Terminal Ready (DTR)	Output

DB-25 Pin NumberAssignment

1	Not Connected	
2	Transmitted Data (TXD)	Output
3	Received Data (RXD)	Input
4	Request To Send (RTS)	Output
5	Clear To Send (CTS)	Input
6	Data Set Ready (DSR)	Input
7	Signal Ground	
8	Data Carrier Detect (DCD)	Input
17	Receive Clock (RXC)	Input
24	Transmit Clock (TXC)	Output

15	Transmit Clock (TXC)	Input
20	Data Terminal Ready (DTR)	Output

The board is set for external clocking which requires a modem or modem eliminator between the PowerNet server and the Host Front End Processor (FEP) or other communications equipment.

Token Ring NIC

Each standard IBM Token Ring 4/16 NIC (Network Interface Card) provides one DB-9 female connector. The cables that connect from the PowerNet server to the Multi-station Access Unit (MAU) for the Token Ring are customer provided. To change the operating data rate for the card, from 16 to 4 Mbps, follow the instructions below.

SNA Physical Units

The SNA/SDLC NCUs are configured for at least one on the installed communications board or NIC. The default maximum of 16 physical units can be configured for both interfaces. Each physical unit (PU), as defined by the SNA protocol, supports up to 8 logical units (LUs). Each terminal must be assigned a logical unit, and therefore, the maximum number of terminals is 8 per configured PU.

Caution: The actual number of terminal supported is determined by many factors and is discussed later.

5250 SDLC Network Menu

The *5250 SDLC* option provides access to the setup screen and various other 5250 connectivity options that are summarized below. Select *5250 SDLC Network* from the *Main Menu* and the menu shown in Figure 2-3 is displayed.

```
                         PowerNet NCU R5.1

            Main Menu
            1 Operations
            2 Spectrum One
            3 Access Point
               5250 SDLC
             * 1 Links
               2 Controllers
               3 LU Mapping
        *      4 Status
               5 Line Trace
        1      6 Adapter Test
        1      7 Driver Test
        1      8 Emulator
        1
           14 Hot Spare
           15 Object Editors
           16 Utilities

                 <ESC>=QUIT  <ARROWS>=MOVE  <ENTER>=SELECT
```

Figure 2-3 5250 SDLC Network Menu

Menu Options

Menu options affecting the available 5250 setup menus (Token Ring and SDLC) shown above are described here. The functionality of the menu items are similar and the applicability of each menu option is indicated.

Links (5250 SDLC)—This option displays a form where host link parameters are specified. The host system administrator must supply configuration information which is then entered on this form.

Controllers (5250 SDLC)—This menu option allows the system administrator to configure the 5250 Controller parameters

LU Mapping (5250 SDLC)— PowerNet assigns each RF terminal a default SNA PU and LU automatically. This option may be used to change these default LU assignments which are in sequential order. The mapping begins with terminal #065 assigned to LU 2, #066 to LU 3, etc.

Status (5250 SDLC)—This option displays the status of PU(s) and LUs.

Line Trace (5250 SDLC)   This option examines the host link data collected with the *Line Trace Facility*. The *Facility* is activated with this option and collects a full display of link exchanges. It should be turned on prior to starting the host connection and should only be used while testing the initial installation. Turn the *Line Trace Facility* **off** when the link has been tested and verified as operational. To turn off this facility, the *SDLC Shutdown* must be selected from the *Operations Menu*, the *TRACE* option on the *Host Connection Setup Form* must be toggled to *OFF*, and he link restarted.

Adapter Test (5250 SDLC only)—This option tests the SDLC host link adapter. This test is useful to ensure that the SDLC adapter is functioning internally with the PowerNet server software.

Driver Test (5250 SDLC only)—This option tests the SDLC host link adapter driver software. This test is useful to ensure that the SDLC driver is functioning internally with the PowerNet server software.

Emulator (5250 SDLC)—Full screen 5250 emulation is provided with this option. The emulator is useful for testing scripts and capturing host screens to a file which can be used by the *Screen Formatter*.

TN5250 Network Menu

The *TN5250 Network* option provides access to the setup screen and emulator options that are summarized below. Select *TN5250 Network* from th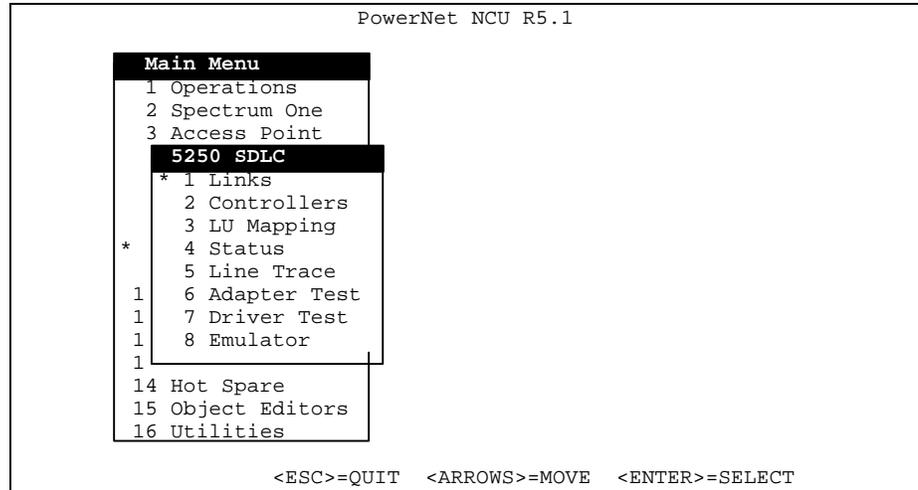e *Main Menu* and the menu shown in Figure 2-4 is displayed. Specific TCP/IP setup options for the TCP/IP portion of the system are described in the TCP/IP system manual

```
 TN5250
*1 Setup
 2 Emulator
```
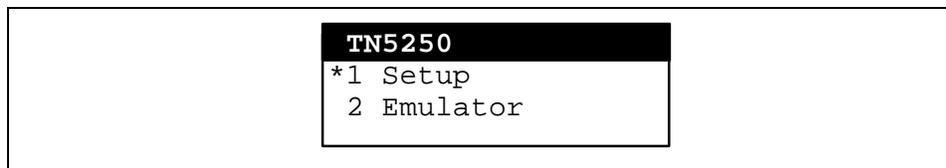
Figure 2-4 TN5250 Network Menu

Setup—This option allows for host session addressing, provided that the TCP/IP setup has been completed.

Emulator—Full screen 5250 emulation is provided with this option. The emulator is useful for testing scripts and capturing host screens to a file which can be used by the *Screen Formatter*.

SDLC Shutdown

Before setting up the link, select the *SDLC Shutdown* option from the *Operations Menu* and press <Enter> to terminate any link to the 5250 host. There is never a need to shutdown TCP/IP to make TN5250 changes. First, a prompt for a confirmation of the shut down action appears on the screen, followed by a list of events as they occur. An SDLC example is shown below.

```
Are you sure that you want to shut down the link to the SDLC Network? (y/n)
```

Press <**y**>.

```
SDLC Shutdown
 Status check ...
 Terminal check ...
Deactivating SDLC Line and Station
Terminal check ...
Press <Enter> to continue
```

Press <*Enter*> and the *Operations Menu* reappears. After all possible activity is
terminated, the setup parameters can be entered for the link to the host.

Link Setup   SDLC

Select *Links* from the *5250 SDLC Network Menu* to display the *Setup Forms*
shown in Figure 2-5 and 2-6. Connection information, supplied by the host system
administrator, is entered on this form. The SDLC links setup form is discussed
here. Form fields are explained following each figure. The type of field, toggle,
text, or display is also listed.

5250 SLDC Link Setup

```
                       SNA SDLC Link Setup
                      Line 1              Line 2
              State [on ]              [on ]
       Clock Source [EXTERN]           [EXTERN]
         Line Speed [9600  ]           [9600  ]
             Duplex [full]             [full]
 Half Duplex RTS Delay [10 ]           [10 ]
    NRZ/NRZI Encoding [NRZ ]           [NRZ ]
           MAX Data [521 ]             [521 ]
 MAX Outstanding Frames [2 ]           [2 ]
 Primary Station Address [FF]          [FF]
  Link Access Protocol [NRM ]          [NRM ]
   Session End Protocol [NOTIFY+UNBIND]  [NOTIFY+UNBIND]

          <ESC>=QUIT  <SPACE>=CHANGE  <ARROWS>=MOVE
```

Figure 2-6 5250 SDLC Host Link Setup Form

This form describes the physical connection parameters to the host system using
the SDLC connection. Notice that there are two lines described for each host
connection possible on the SNA/SDLC card.

5250 SDLC Host Link Setup Form - Fields

State [Toggle Field] The line may be set to either *ON* or *OFF*.

   Clock Source [Toggle Field] The line may be set to either *EXTERN* (default),
         or *INTERN*. Please note that most connections use the *EXTERN* option.

Use of the *INTERN* option should only be used in explicit cases as a special cable and other considerations need to be made when using this option.

Line Speed [Toggle Field] Line speeds selections are 300, 1200, 2400, 4800, 9600, 19200, 38400, 56000, 57600, 64000, 100K, 200K, 500K, and 1.544M Baud. Toggle to the speed setting provided by the System Administrator.

Duplex [Toggle Field] Line communication can be either *FULL* or *HALF* duplex. It must be half-duplex if more than one line is connected to an MSU (Multi-station Sharing Unit - Line Sharing Device or MUX) otherwise, the PowerNet server does not release control of the line to other devices on the MSU.

Half Duplex RTS Delay [Text Field] This value is in milliseconds. When implementing half duplex data communication schemes, it is common for the host to experience a slight delay in line turnaround time, especially if a line sharing device (MSU or MUX) is used. The default value (10ms) should be used as a starting point in controller setup. If you are experiencing data errors, missing frames, data timeouts, etc., setting this to a higher value increases the amount of time the controller waits for a line turnaround to occur. Values for this field can range from 0 to 999.

NRZ/NRZI Encoding [Toggle Field] The method for encoding data for transmission can be either *NRZ* (non-return to zero) or *NRZI* (non-return to zero inverted). This value must match the encoding parameter as set on the host system and is provided by the host system administrator. If this value does not match the host parameter, the system does not operate.

Max Data [Toggle Field] The Max Data field is used to set the maximum size of the data blocks sent from the host system. The default value for this field is 521. This value is supplied by the host system administrator and must match the value as set on the host. Toggle values for this field are 261, 265, 517, 521, 1029, 1033, 2052, or 2057. If this value does not match the value as set on the host system, intermittent session and/or line drops may occur.

Max Outstanding Frames [Text Field] The max outstanding frames field corresponds to the host setup field option of the same name. It controls the number of SNA frames that can be transmitted before an acknowledgment is required. If this value does not match the host value, data frames may be missed, sessions may hang, and/or session drops may occur.

Primary Station Address [Text Field] Enter the unique SDLC address of the line, which is 2 hex digits (01 to FF). The default value of FF is used in most cases, but may be different depending on the host system. Verify this value with the host system administrator.

Link Access Protocol [Toggle Field] The link access protocol defines which manner the PowerNet server interprets the protocol from the host system. This is a toggle field with values of *NRM*, *QLLC*, and *LLC2* and values must match the parameters as set by the host system administrator as these may vary depending on the host computer system. The default for this field is *NRM* and can be used with most host systems. Selection at this field depends on the host computer environment.

Session End Protocol [Toggle Field] The Session End Protocol Option determines the method used to end a 5250 session. The selections are *NOTIFY+UNBIND, TERMSELF, LUSTAT, LUSTAT+DRI,* and *NOTIFY*. The default is *NOTIFY+UNBIND* and can be used with the majority of mainframe hosts. Selections used here depend upon the host.

When the form is complete, press the <Esc> key. If changes were made to the form, a confirmation prompt is presented. Press <**Y**> to save the changes.

Controller Setup - 5250 SDLC

Select *Controllers* from the *5250 SDLC Network Menu* to display the *Controller Setup Forms* shown in 2-6 (SDLC). Connection information, supplied by the Host System Administrator, is entered on this form. The SDLC form has no differences and is discussed here. Form fields are explained following each figure. The type of field, toggle, text, or display is also listed.

```
                SNA SDLC 5250 Controller Setup   Page 1

            Status   Line   Address    XID       Devices
         1 [on ]     [2]     [01]    [05400001]   [8   ]
         2 [off]     [1]     [02]    [05400002]   [8   ]
         3 [off]     [1]     [03]    [05400003]   [8   ]
         4 [off]     [1]     [04]    [05400004]   [8   ]
         5 [off]     [1]     [05]    [05400005]   [8   ]
         6 [off]     [1]     [06]    [05400006]   [8   ]
         7 [off]     [1]     [07]    [05400007]   [8   ]
         8 [off]     [1]     [08]    [05400008]   [8   ]
         9 [off]     [1]     [09]    [05400009]   [8   ]
        10 [off]     [1]     [0A]    [0540000A]   [8   ]
        11 [off]     [1]     [0B]    [0540000B]   [8   ]
        12 [off]     [1]     [0C]    [0540000C]   [8   ]
        13 [off]     [1]     [0D]    [0540000D]   [8   ]
        14 [off]     [1]     [0E]    [0540000E]   [8   ]
        15 [off]     [1]     [0F]    [0540000F]   [8   ]
        16 [off]     [1]     [10]    [05400010]   [8   ]

<ESC>=QUIT <SPACE>=CHANGE <ARROWS>=MOVE <CTRL><B>=PGUP
<CTRL><F>=PGDN
```

Figure 2-8 SDLC 5250 Controller Setup Form

Controller Setup Form - Fields

Status [Toggle Field] This field activates or deactivates the contoller from the host link. Values for this field are *ON* or *OFF.*

Line [Toggle Field] The line parameter is used to select which host connection or line number (as set in the *Links* setup form) used to attach to the host system.

Address [Text Field] Enter the unique SDLC address of the controller attached to the line, which is 2 hex digits (01 to FF). The default value *nn* of this field must be matched to the controller address as provided by the host system administrator. Typically, but not always, this value matches the last two characters of the controller's XID. Again, this value must match the controller address setting as defined by the host system administrator.

XID [Text Field] This value is provided by the host system administrator as controller XID (exchange identifier) addresses are set in the host system at the controller definition level. These values are sometimes generated by the controller definition on the host or they can be set by the host system administrator. In any case, this value must match the XID parameter for the controller definition on the host system.

Devices [Toggle Field] This setting allows configuration of the maximum number of LUs (logical units) that can be established on the defined

controller. Value for this field is 8 for a 5294-1 controller. This value
sets the number of LUs that can be managed by the PowerNet server.
This setting should match the controller settings as defined on the host
system. If the value for this field as set on the PowerNet server
exceeds the allowable number of LUs as defined on the host,
terminals mapped to unallowed LUs are not able to attach to the host
system.

Caution: Keep in mind that this value can be set to exceed the number of
active terminal sessions that the PowerNet server may be
configured to support. Although this may be true, the PowerNet
server as configured only permits the allowable number of active
terminals in session with the host computer at any one time.

TN5250 Setup

Select *Setup* from the *TN5250 Network Menu* to display the *TN5250 Setup Form*
shown in Figures 2-9. Connection address information, supplied by the host
system administrator, is entered on this form. Selection of the station addresses is
accomplished by toggling through the available connections as set under TCP/IP
Addresses from the TCP/IP Network Menu. See the TCP/IP manual for TPC/IP
address setup information.

```
                          TN5250 Setup

                             Hosts
              0 [trn2501p      ]   4 [trn2001a       ]
              1 [trn2001a      ]   5 [trn2501a       ]
              2 [trn1000l      ]   6 [trn2501p       ]
              3 [trn1000r      ]   7 [ttysrv         ]








              <ESC>=QUIT  <SPACE>=CHANGE  <ARROWS>=MOVE
```

Figure 2-9 TN5250 Setup Form

SDLC Startup

After configuring the necessary host connection links and controllers, the host
network link must be started. Return to the *Operations Menu* and select *SDLC
Startup*, then press <**Enter**>. The process begins and an on-screen list of events
are displayed as they occur, as illustrated below.

```
SDLC Start UP
Status check ...
SDLC Server
```

```
Server ...
Entering GCOM event monitor at Fri Aug 13 13:51:19
Press <Enter> to continue
```

Press <**Enter**> and the *Operations Menu* reappears.

LU Mapping

LU mapping, common to 5250 SDLC and Token Ring, is used to map specific
terminal addresses to specific LU sessions on the host computer system. This
setup aids in locating specific terminals/LU sessions in determining any systems
related issues. In some environments it is also possible to tie applications to
specific LUs, thus eliminating, in some cases, extra security requirements. An
example of the LU mapping screen is shown below in figure 2-10.

To allow terminals to map to different LU sessions, simply type the terminal
address in the field next to the LU session number.

```
                          SNA LU Session Mapping

   CONTROLLER LU   TERM       CONTROLLER LU   TERM       CONTROLLER LU    TERM
   SD-1   5250 2   [65  ]     SD-1   5250 18  [81  ]
   SD-1   5250 3   [66  ]     SD-1   5250 19  [82  ]
   SD-1   5250 4   [67  ]     SD-1   5250 20  [83  ]
   SD-1   5250 5   [68  ]     SD-1   5250 21  [84  ]
   SD-1   5250 6   [69  ]     SD-1   5250 22  [85  ]
   SD-1   5250 7   [70  ]     SD-1   5250 23  [86  ]
   SD-1   5250 8   [71  ]     SD-1   5250 24  [87  ]
   SD-1   5250 9   [72  ]     SD-1   5250 25  [88  ]
   SD-1   5250 10  [73  ]     SD-1   5250 26  [89  ]
   SD-1   5250 11  [74  ]     SD-1   5250 27  [90  ]
   SD-1   5250 12  [75  ]     SD-1   5250 28  [91  ]
   SD-1   5250 13  [76  ]     SD-1   5250 29  [92  ]
   SD-1   5250 14  [77  ]     SD-1   5250 30  [93  ]
   SD-1   5250 15  [78  ]     SD-1   5250 31  [94  ]
   SD-1   5250 16  [79  ]     SD-1   5250 32  [95  ]
   SD-1   5250 17  [80  ]     SD-1   5250 33  [96  ]



                     <ESC>=QUIT   <ARROWS>=MOVE
```

Figure 2-10 SDLC LU Mapping Setup Form

Status

Once the appropriate host setup procedures have been implemented and the host communications link has been started, the *Status Form* should be consulted in order to determine the link, controller, and device status of all units configured to the host. Information on this form help determine if the link is established and if the PU(s) are configured properly.

Select *Status* from the *SDLC Network Menu* or the *5250 Token Ring Network Menu* and the *Status Display Form* shown below appears.

```
*** All Controllers and Links ***

UPA MODULE DLPI_STATE LPA MUX BIND  LAP_TYPE PRIM  SEC        XMIT
RCV
--- ------ ---------- --- --- ----  -------- ----  --- ---------- ---------
-
  1   hdlc  info_xfer  1  88   01   nrm_sec    -    01         111
166

Select Controller:
```

Figure 2-11 Status Display Form

When this form is displayed, the operator can select the controller to gather the station status from. In this form, the following fields are used

> **UPA**   (Upper Point of Attachment) This is actually the controller number of the internally emulated controller of the PowerNet server. If multiple host connections and adapters are implemented in a PowerNet server, then multiple controllers (UPAs) are listed here. In order to select a particular controller to examine, select the controller's UPA number and enter it after the prompt Select Controller:

> **Module -** This field defines the software module associated with the UPA. In the 5250 environment, this is always HDLC.

> **DLPI_STATE -** This field provides information regarding the connection state of the emulated controller. Normally, this field displays `info_xfer` for a properly configured controller. Any other display in this field should be noted and controller and/or host parameters adjusted accordingly to correct the situation.

> **SEC**   This field displays the controller address.

XMIT This field displays the number of frames transmitted to the host.

   RCV   This field displays the number of frames transmitted to the
            controlled from the host.

   Note: If this value does not contain a number greater than zero (0), a
            configuration problem is occurring. This problem usually is in
            the cabling between the host and the NCU.

Status Display Form - Fields

The *Status Display Form* is for information purposes only. Its fields cannot be
changed. The form may consist of multiple pages.

```
UPA MODULE DLPI_STATE LPA MUX BIND  LAP_TYPE PRIM  SEC       XMIT       RCV
--- ------ ---------- --- --- ----  -------- ----  --- ---------- ----------
 1   hdlc  info_xfer   1  88   01    nrm_sec   -   01        111        166

Select Controller: 1
01  LU  X25_State SNA mode hdx ff_state FMD_rcvd FMD_sent rcv_last snd_last
     2      Discon  2  FDX   Contention        2        0 13:03:28
     3    Dataxfer  3  HDX   BracketSnd        2        0 16:15:44
     4      Discon  2  FDX   Contention        0        0
     5      Discon  2  FDX   Contention        0        0
     6      Discon  2  FDX   Contention        0        0
     7      Discon  2  FDX   Contention        0        0
     8      Discon  2  FDX   Contention        0        0
     9      Discon  2  FDX   Contention        0        0



                      Press ENTER to continue
```

Figure 2-12 Status Display Form, page 1

LU - The number of the logical unit attached (configured) to the controller

   X.25_State - The status of the LU should be *Dataxfer* (active) during normal
            operation of the system. This indicates that the communications link
            is established, in use, and functioning properly.

When the state is *Discon*, it indicates that the LU is available for use but there has
been no communication with the host. It also shows that there are no terminals in
session with the host.

The full-screen emulation option can be used to establish a terminal session with
the host. If the emulator is being used, it is assigned to an active LU.

Line Trace

The *Line Trace Facility* collects link data. It is turned on and off from the *Host
Connection Setup Form* (see Figures 2-5 and 2-6). The information is displayed

with this option. **Do not activate this facility during normal operation** because the high overhead on the system causes poor operation.

Understanding the formatted output of the SNA link trace requires some knowledge of SNA protocols. The most useful and comprehensive document is IBM document number GA27-3136-9, *SNA Formats*.

For LU type 7 links, the type used by 5294 controllers, the startup sequence requires that the host send an ACTPU frame followed by the appropriate number of ACTLU frames, each of which enables a terminal LU session. The PowerNet server should respond positively to each of these frames. In the event negative responses are displayed, a sense code is included in the response. Sense codes and their meanings are described in the above-mentioned IBM, *SNA Formats* manual.

Remember to turn the *Line Trace Facility* **off** when the link has been tested and verified as operational. To turn off this facility, the *SDLC Shutdown* must be selected from the *Operations Menu*. Next, the *TRACE* option on the *Host Connection Setup Form* must be toggled to *OFF* (see *Setup* above). The link is then restarted.

To select a line trace, select the Line Trace option from the 5250 SLDC menu. A screen similar to the one below appears, allowing the operator to select the particular adapter to trace.

```
*** All Controllers and Links ***

UPA MODULE DLPI_STATE LPA MUX BIND  LAP_TYPE PRIM  SEC      XMIT        RCV
--- ------ ---------- --- --- ----  -------- ----  --- ---------- ----------
  1   hdlc idle_state  1  84   01   nrm_sec    -   01       -           0
  2   hdlc idle_state  1  84   02   nrm_sec    -   01       -           0
  3  frame   UNBOUND   2  88   01       lapb  01   03       -           0

Select link for trace (LPA number):
```

Figure 2-13 Line Trace Selection Form

Once a link is selected, the line trace appears on the display of the console. The following pages contain part of a sample *Line Trace*.

Sample Line Trace

```
NPI Trace Table on lpa 1 at (Rsys 842054650) 08/17/94 08:32:53
  No history table

sna level Trace Table:

IN BOUND: TH: 2c003a010037 OIS -Exp daf 58 oaf 1 Seq 55 : 214 at
841711600
```

```
          RH: 039040 FMD Req OIC: DR1 ERI EB
          RU: Length = 205
          f5 c2 11 c1 d4 13 11 more       5B.AM..

OUTBOUND: TH: 2c000143007f OIS -Exp daf 1 oaf 67 Seq 127 : 12 at
841714700
          RH: 0390a0 FMD Req OIC: DR1 ERI BB CDI
          RU: Length = 3
          7d c1 d4                        'AM

IN BOUND: TH: 2c004301009b OIS -Exp daf 67 oaf 1 Seq 155 : 231 at
841715000
          RH: 039040 FMD Req OIC: DR1 ERI EB
          RU: Length = 222
          f5 c2 11 c6 d4 13 11 more       5B.FM..

OUTBOUND: TH: 2c0001430080 OIS -Exp daf 1 oaf 67 Seq 128 : 12 at
841716300
          RH: 0390a0 FMD Req OIC: DR1 ERI BB CDI
          RU: Length = 3
          7d c6 d4                        'FM

IN BOUND: TH: 2c004301009c OIS -Exp daf 67 oaf 1 Seq 156 : 231 at
841716750
          RH: 039040 FMD Req OIC: DR1 ERI EB
          RU: Length = 222
          f5 c2 11 c6 d4 13 11 more       5B.FM..

OUTBOUND: TH: 2c000112000f OIS -Exp daf 1 oaf 18 Seq 15 : 27 at 841761450
          RH: 0390a0 FMD Req OIC: DR1 ERI BB CDI
          RU: Length = 18
          7d c1 60 11 c1 d4 f0 more       'A-.AM0

IN BOUND: TH: 2c0012010013 OIS -Exp daf 18 oaf 1 Seq 19 : 214 at
841761850
          RH: 039040 FMD Req OIC: DR1 ERI EB
          RU: Length = 205
          f5 c2 11 c1 d4 13 11 more       5B.AM..

OUTBOUND: TH: 2c0001310012 OIS -Exp daf 1 oaf 49 Seq 18 : 37 at 841763200
          RH: 0390a0 FMD Req OIC: DR1 ERI BB CDI
          RU: Length = 28
          7d c2 6a 11 c1 d4 f0 more       'B|.AM0

OUTBOUND: TH: 2c0001120010 OIS -Exp daf 1 oaf 18 Seq 16 : 27 at 841763650
          RH: 0390a0 FMD Req OIC: DR1 ERI BB CDI
          RU: Length = 18
          7d c1 60 11 c1 d4 f0 more       'A-.AM0

IN BOUND: TH: 2c0031010016 OIS -Exp daf 49 oaf 1 Seq 22 : 214 at
841763800
          RH: 039040 FMD Req OIC: DR1 ERI EB
          RU: Length = 205
          f5 c2 11 c1 d4 13 11 more       5B.AM..

IN BOUND: TH: 2c0012010014 OIS -Exp daf 18 oaf 1 Seq 20 : 214 at
841764000
          RH: 039040 FMD Req OIC: DR1 ERI EB
```

```
                      RU: Length = 205
                      f5 c2 11 c1 d4 13 11 more      5B.AM..

          OUTBOUND: TH: 2c0001300035 OIS -Exp daf 1 oaf 48 Seq 53 : 35 at 841767950
                    RH: 0390a0 FMD Req OIC: DR1 ERI BB CDI
                      RU: Length = 26
                      7d c2 e8 11 c1 d4 f0 more      'BY.AM0

            .
            .
            .

          IN BOUND: TH: 2c002f01009c OIS -Exp daf 47 oaf 1 Seq 156 : 231 at
          842035750
                      RH: 039040 FMD Req OIC: DR1 ERI EB
                      RU: Length = 222
                      f5 c2 11 c1 d4 13 11 more      5B.AM..

          OUTBOUND: TH: 2c00012f0091 OIS -Exp daf 1 oaf 47 Seq 145 : 38 at
          842039650
                      RH: 0390a0 FMD Req OIC: DR1 ERI BB CDI
                      RU: Length = 29
                      7d 40 d3 11 40 4c f1 more      ' L. <1

          IN BOUND: TH: 2c002f01009d OIS -Exp daf 47 oaf 1 Seq 157 : 205 at
          842039950
                      RH: 039040 FMD Req OIC: DR1 ERI EB
                      RU: Length = 196
                      f5 c2 11 c1 d4 13 11 more      5B.AM..

          IN BOUND: TH: 2d0011014cf1 OIS Exp daf 17 oaf 1 Seq 19697 : 11 at
          842045700
                      RH: 6b8000 SC Req FI OIC: DR1 -ERI
                      RU: UNBIND (32) Normal End of Sesion, Length = 2
                      32 01                     ..

          OUTBOUND: TH: 2d0001114cf1 OIS Exp daf 1 oaf 17 Seq 19697 : 11 at
          842045700
                      RH: eb8000 SC Res FI OIC: DR1 -ERI
                      RU: UNBIND (32) Length = 2
                      32 01                     ..

          IN BOUND: TH: 2c0011000016 OIS -Exp daf 17 oaf 0 Seq 22 : 76 at 842046100
                      RH: 038000 FMD Req OIC: DR1 -ERI
                      RU: Length = 67
                      15 40 e6 c5 d3 c3 d6 more      . WELCO

          OUTBOUND: TH: 2c0000110016 OIS -Exp daf 0 oaf 17 Seq 22 : 9 at 842046100
                      RH: 838000 FMD Res OIC: DR1 -ERI

          OUTBOUND: TH: 2c00012f0092 OIS -Exp daf 1 oaf 47 Seq 146 : 28 at
          842051150
                      RH: 0390a0 FMD Req OIC: DR1 ERI BB CDI
                      RU: Length = 19
                      7d c1 61 11 c1 d4 f5 more      'A/.AM5

          IN BOUND: TH: 2c002f01009e OIS -Exp daf 47 oaf 1 Seq 158 : 233 at
          842051550
                      RH: 039040 FMD Req OIC: DR1 ERI EB
```

```
               RU: Length = 224
               f5 c2 11 c6 d4 13 11 more      5B.FM..

       sna level Probe Trace Table:
       008500  Hist Type 44      (   18) 2d 00 00 00 06 b1 6b 80
       237955950  Hist Type 44      0A->0C DISC extra=0000 bfrp=0
       othr=0
       237959750  Hist Type 44      (   18) 2d 00 00 00 51 83 6b 80
       421899000  Hist Type 44      0A->0C DISC extra=0000 bfrp=0
       othr=0
       426460350  Hist Type 44      (   18) 2d 00 00 00 02 61 6b 80
       550424450  Hist Type 44      0A->0C DISC extra=0000 bfrp=0
       othr=0
       561426800  Hist Type 44      (   18) 2d 00 00 00 02 3d 6b 80
       203 03e OIt 84186 18 18 e8 11 52203 03e OIt 84186 18 18 e8
       11 52203 03e OIt 84186 18 18 e8 11 52203 03e OIt 84186 18 18
       e8 11 52203 03e OIt 84186 18 18
```

Adapter Test (SDLC Only)

The adapter test is used to test the SDLC host link adapter. This test is useful to
ensure that the SDLC adapter is functioning internally with the PowerNet server
software. To activate the test, select *Adapter Test* from the *5250 SDLC* menu and
follow the instructions on the screen.

> *Caution:*   Do not run the adapter test on a live system. Doing so disconnects
> any active users as the active SDLC link needs to be brought
> down during this test.

```
SDLC Hardware Check

Are you sure you want to shutdown the SDLC network (y/n)?
```

Figure 2-14 Adapter Check SDLC shutdown screen

After shutting down the SDLC connection, the following tests and results are
displayed for a properly operating Adapter.

```
Are you sure you want to shutdown the SDLC network (y/n)? y


Starting dlpitst at Thu Sep 26 16:42:57 1996
Test 1 Connection established: lpa 1 bind 1 pid 8541
Data test 1 lasted 9 seconds.
Test 1 sent 50 msgs   6400 bytes for   5 msgs per second or 5688 baud.
Test 1 rcvd 50 msgs   6400 bytes for   5 msgs per second or 5688 baud.
```

```
Starting dlpitst at Thu Sep 26 16:43:06 1996
Test 1 Connection established: lpa 1 bind 1 pid 8542
Data test 1 lasted 15 seconds.
Test 1 sent 50 msgs    50 bytes for   3 msgs per second or  26 baud.
Test 1 rcvd 50 msgs    50 bytes for   3 msgs per second or  26 baud.


UPA MODULE DLPI_STATE LPA MUX BIND  LAP_TYPE PRIM  SEC   XMIT  RCV
--- ------ ---------- --- --- ----  -------- ----  --- ----- --------
  1   hdlc    UNBOUND  1  74  01          abm  01   03    140      140


Deactivating SNA test server

Press ENTER to continue
```

Figure 2-15 Adapter Check screen

Driver Test (SDLC only)

Use this option to test the SDLC host link adapter driver software. This test is
useful to ensure that the SDLC driver is functioning internally with the PowerNet
server software.

Caution: Do not run the driver test on a live system. Doing so
disconnects any active users as the active SDLC link needs to
be brought down during this test.

```



 

 



SDLC Driver Software Check

Are you sure you want to shutdown the SDLC network (y/n)?
```

Figure 2-16 Driver Check SDLC shutdown screen

After shutting down the SDLC connection, the following tests and results are
displayed for a properly operating Adapter.

```
Starting dlpitst at Thu Sep 26 16:49:50 1996
Test 1 Connection established: lpa 1 bind 1 pid 8556
Data test 1 lasted 7 seconds.
Test 1 sent 1000 msgs 128000 bytes for 142 msgs per second or 146285 baud.
Test 1 rcvd 1000 msgs 128000 bytes for 142 msgs per second or 146285 baud.

Starting dlpitst at Thu Sep 26 16:49:57 1996
Test 1 Connection established: lpa 1 bind 1 pid 8557
Data test 1 lasted 6 seconds.
Test 1 sent 1000 msgs   1000 bytes for 166 msgs per second or 1333 baud.
Test 1 rcvd 1000 msgs   1000 bytes for 166 msgs per second or 1333 baud.


                                        receive-errs    xmt-errs
UPA       CDI_State Frames-out  Frames-in  wd mf af crc ovr  abt und abt
---    ------------- ---------- ----  -- -- --  ---- ---- ----  ---- ----
  1    INPUT_ALLOWED     6994      6994  0  0  0  0   0   0   0   0

Deactivating SNA test server

Press ENTER to continue
```

Figure 2-17 Driver Check screen

5250 Terminal Emulator

This option provides full screen, 24 by 80, 5250 terminal emulation. It can be run from either the service or dialup modem port. It is useful for verifying the initial installation and for developing Dialog Scripts.

Select *Emulator* from the *5250 Menu* and a prompt appears allowing the operator to select either the diagnostic emulator or the standard emulator as shown in figure 2-18.

```
Select Emulator
        1. Diagnostic
        2. Standard
Selection:
```

Figure 2-18 Emulator Selection

The Standard Emulator is used to test the PowerNet server's connection to the host system. To test the connection, select the Standard emulator by pressing **2** followed by <Enter>. If the connection to the host is configured correctly, a host screen should appear. A typical AS/400 login screen is shown in figure 2-19.

```
                         Sign On
                                        System . . . . . . : DEVL
                                        Subsystem  . . . . : TEST01
                                        Display  . . . . . : TERM02

                 User . . . . . . . . . . . . _
                 Password . . . . . . . . . .
                 Program/procedure  . . . . .
                 Menu . . . . . . . . . . . .
                 Current Library  . . . . . .




                 (c) COPYRIGHT IBM CORP. 1980, 1993
```

Figure 2-19 Typical Login Screen on an AS/400

If the PowerNet server experiences problems establishing a session with the host system, a message, `g5250 exiting: can't open SNA stream`, appears on the display. Recheck the configurations, line connections, and re-verify the controller, line, and terminal device setups on the host system.

Standard Emulator Keys

When in the standard emulator, the local keyboard in use has special key definitions that emulate keys found on 5250 terminal workstations. The emulator provides the following keyboard translations to accommodate non-5250 keyboards

Control Keys	**Action**
<ESC><Q>	Quit the Standard Emulator

5250 AID Key Mapping	**Function**
<TAB>	Field Advance
<ESC> <TAB>	Field Backspace
<ENTER>	Field Exit
<ESC> <ENTER>	Enter/Rec Adv
<CTRL><E>	Cursor Up
<CTRL><D>	Cursor Down
<CTRL><S>	Cursor Left
<CTRL><F>	Cursor Right
<CTRL><H>	Backspace
<CTRL><J>	New Line
<ESC> <A>	Attention
<ESC> <C>	Clear
<ESC> <E>	Erase Input (ErInp)
<ESC> <H>	Help
<ESC> <I>	Insert
<ESC> <P>	Print (to system printer)
<ESC> <U>	Roll Up

<ESC> <D>	Roll Down
<ESC> <R>	Reset
<ESC> <S>	SysRq

5250 Function Key Mapping	**Function**
<ESC> <1-9>	F1-9
<ESC> <0>	F10
<ESC> <->	F11
<ESC> <=>	F12
<ESC> <!>	F13
<ESC> <@>	F14
<ESC> <#>	F15
<ESC> <$>	F16
<ESC> <%>	F17
<ESC> <^>	F18
<ESC> <&>	F19
<ESC> <*>	F20
<ESC> <(>	F21
<ESC> <)>	F22
<ESC> <_>	F23
<ESC> <+>	F24

> **NOTE**: Control Keys Sequences are accomplished by pressing and holding the <CTRL> key and then pressing the associated Upper Case character. Escape key Sequences are accomplished by pressing and releasing the <ESC> key and then pressing the associated character for the desired action.

The Diagnostic Emulator

The diagnostic emulator uses the same emulation program that the remote RF terminals use for accessing the host system. The diagnostic emulator is used to select specific LU/PU associations in the event that a particular terminal cannot access a system. This emulator is also used in conjunction with the *Screen Formatter* tool which is orderable as an option to the PowerNet system.

To select the diagnostic emulator, press **1** when presented with the emulator selection prompt as shown in figure 2-18. A second level prompt appears as shown in figure 2-21 allowing the operator to select the specific controller and PU to access through the emulator for the LU that is used for establishing a session with the host. Enter the number of an *IDLE* LU. The host logon or screens appear on the terminal display.

```
Select Emulator
        1. Diagnostic
        2. Standard
Selection: 1

Enter Controller number (1-16): 1

Enter LU number (0 to 7): 1

Emulator help key is CTRL-Y. Press ENTER to continue
```

Figure 2-21 Diagnostic Emulator Startup

The emulator provides the following keyboard translations to accommodate non-5250 keyboards.

Control Keys   **Action**

<CTRL><Y>   Help
<CTRL><D>   PS information
<CTRL><X>   Exit
<CTRL><E>   Escape to UNIX shell
<CTRL><F>   Formatter
<CTRL><T>   Set Formatter Object
<CTRL><P>   Take Picture
<DELETE>   Abort

5250 Key Mapping   **Function**

<TAB>   TAB
<ENTER>   FIELD EXIT
<ESC><N><ENTER> ENTER
<ESC><TAB><ENTER>   BACKTAB
<ESC><C><ENTER> CLEAR
<ESC><E><ENTER> EOF
<ESC><1-24><ENTER>   PF1-24
<ESC><S><ENTER> SYSREQ
<ESC><R><ENTER> RESET
<ESC><D><ENTER> ROLLDOWN
<ESC><U><ENTER> ROLLUP

3 Configuration

Introduction

Once the communication path between the PowerNet server and the 5250 Host is operational, the system can be configured. The *Host List* is tailored to contain the application(s) and Host(s) that are available for use by RF terminal operators. Each of these entries is assigned the *5250 Handler*, which in turn can be customized for each application/Host.

Host List

The Host List appears on RF terminals once they are logged in and configured. The *Host List* is constructed and changed with the *Host List Setup Form*. There is no need to use a line editor. The default contents of the *Host List* correlates with the 5250 connectivity option that is part of this system. Accordingly, *WHIP* appears as a default with *Check* as its Handler. Under the 5250 SNA connectivity architecture, a *5250 Handler* is available for 5250 Hosts and Host applications. Select *Host List* from the *SDLC Menu* and the form shown in Figure 3-1 appears.

```
                        Host List Setup

 Menu Name      Handler   Active              Custom Options
[VTERM      ] [VTERM  ] [yes] [                                      ]
[PTTY       ] [PTTY   ] [yes] [                                      ]
[SD3270     ] [3270   ] [yes] [                                      ]
[TR3270     ] [3270   ] [yes] [                                      ]
[TN3270     ] [TN3270 ] [yes] [                                      ]
[SD5250     ] [5250   ] [yes] [                                      ]
[TN5250     ] [TN5250 ] [yes] [                                      ]
[           ] [NONE   ] [no ] [                                      ]
[           ] [NONE   ] [no ] [                                      ]
[           ] [NONE   ] [no ] [                                      ]
[           ] [NONE   ] [no ] [                                      ]
[           ] [NONE   ] [no ] [                                      ]
[           ] [NONE   ] [no ] [                                      ]
[           ] [NONE   ] [no ] [                                      ]
[           ] [NONE   ] [no ] [                                      ]
[           ] [NONE   ] [no ] [                                      ]
[           ] [NONE   ] [no ] [                                      ]


        SNA SDLC or Token Ring 3270 Terminal Emulation
           <ESC>=QUIT   <ARROWS>=MOVE   <ENTER>=SELECT
```

Figure 3-1 Host List Setup Form

To enter a new selection, use the right or down <Arrow> keys to place the cursor on a blank line under the Menu Name column. This is the name of option as shown on the RF terminal. Upper case and lower case keys can be used, and reflects in the option name as it appears on the terminal.

Press the right <<Arrow> to proceed to the *Handler* field. This is a toggle field and the <Tab> key is used to change the selection to 5250. The handler refers not only to the type of connectivity that the application or Host works under, but also to the software that processes (handles) that application/Host in the PowerNet server.

Once the *5250 Handler* is selected, press the *<Enter>* key to view the 5250 *Handler Setup Form* (see Figure 3-2) to further customize the use of this software. If *Quick Start* operation is being implemented, customization should not be necessary.

```
[SD5250     ]          5250 Handler Setup - EXPRESS    Page 1


        Keyboard                   Alarm                  Formatter
        End Key [pf10   ]           Mode [bell ]          Object [        ]
        Hot Key [noop   ]         Volume [hi ]          Alt. Key [noop   ]
  Auto Send Key [tab    ]       Duration [150 ]          Dialog
      Key Click [on ]          Frequency [0     ]          Object [DFLT    ]
Case Conversion [none ]     Scan Duration [300 ]          Timers
        Scanner            Scan Frequency [0    ]           Radio [120]
       Send Key [enter  ]  Allow Multiple [yes]            Power [300]
     Scan Ahead [1 ]              Printer              Backlight [0  ]
        Display                     Type [none    ]        TN5250
  Quadrant Mode [on   ]      Init Object [        ]  Host Number [0]
       Lock Row [0 ]          Flag Byte [0   ]
    Lock Column [0 ]           Flag Row [0 ]
    Scroll Mode [full]      Flag Column [0 ]
   Wait Message [on ]          Clear Key [noop   ]






     <ESC>=QUIT <SPACE>=CHANGE <ARROWS>=MOVE <CTRL><B>=PGUP <CTRL><F>=PGDN
```

Figure 3-2 5250 Handler Setup Form - Page 1

```
[SD5250      ]        5250 Handler Setup - ADVANCED      Page 2

        Keyboard                  Display                  Relocation
 Mapping Object [      ]  Mapping Object [        ]          Source [0 ]
   Allow Cursor [yes]          Language [english ]  Destination [0 ]
        Scanner             Reverse Video [on ]        Row Count [0 ]
  Length Check [off]         Default Data [off]       Move Blank [no ]
    Truncation [off]               Cursor [hard]       Keepalive
     Stripping [off  ]        Double High [no ]          Minutes [0 ]
    Binary-128 [off]          Double Wide [no ]         Send Key [noop    ]
  Scanner Type [Laser    ]          Alarm              Log Levels
 Scanner Objects               Alternate [off]           General [1]
   Data Mapping [       ]            Row [0  ]           Display [0]
    Data Editor [       ]         Column [0   ]          Dialog [0]
 Decoder Control [       ]      RF Polling           Datastream [0]
                               Initial [4 ]                 SNA [0]
                                 Final [32]
                                Switch [10]
                             AP Polling
                            Primary/Min [2 ]
                                   Max [0 ]
                             Algorithm [0 ]


     <ESC>=QUIT <SPACE>=CHANGE <ARROWS>=MOVE <CTRL><B>=PGUP <CTRL><F>=PGDN
```

Figure 3-3 5250 Handler Setup Form - Page 2

```
[SD5250      ]        5250 Handler Setup - ADVANCED      Page 3

        Keyboard
   Clear First [off]
        Display
   Show Prompt [off]
        Printer
         Start [                ]
           End [                ]
 Start Convert [                ]
   End Convert [                ]
 VT100 Extension
         Start [                ]
           End [                ]










     <ESC>=QUIT <SPACE>=CHANGE <ARROWS>=MOVE <CTRL><B>=PGUP <CTRL><F>=PGDN
```

Figure 3-4 3270 Handler Setup Form - Page 3

If the *5250 Handler* will be customized, proceed with the *5250 Handler Setup Form* section. If not, use the *Quick Start* instructions in the next paragraph.

For *Quick Start*, use the right <Arrow> key to proceed to the *Active* field on the *Host List Setup Form*. Initially, a *Host List* option is not active. Use the <Tab> key to toggle the *Active* field to *Yes*. It now appears in the *Host List* on the RF

terminal when the list is displayed. The *Custom Options* field on this form should be left blank, unless Release Notes, which may accompany the package, indicate otherwise.

5250 Handler Setup Forms

This form (actually two pages of on screen material) contains fields for pulling together all available 5250 customization features, such as Dialog Scripts and reformatted Host screens for Host List options. In addition, this *Handler Setup Form* lets you customize additional items, including RF terminal keys, bells, transmission modes, **whip500.HEX** operation, the data stream, and RF terminal logs. Toggle between setup pages by the <CTRL><B>=PAGEUP or <CTRL><F>=PAGEDN noted at the foot of each page. (In the name **whip500.HEX**, **500** is the version number of *whip*. The current version is **whip500.HEX**.)

5250 Handler Setup Form

Certain fields may have sub-screens, which are included with the option. Once the sub-screen is explained, the discussion returns to the *5250 Handler Setup Form*. The setup form is divided into sections that allow the user to configure certain features of the remote terminal operations such as keyboard, display, printer, alarms, formatter, and relocation. Each section and its appropriate fields are described below.

5250 Handler Setup Form - Fields

> **Menu Name** [Display Field] This field in the upper left corner of the screen displays the name of the Host or application as it appears on the *Host List*. This name is entered on the *Host List Setup Form*. It cannot be changed here.

Setup Form - Page 1
KEYBOARD SECTION

> **End Key** [Toggle Field] - Default *pf10*. Select the RF terminal key which must be pressed to terminate a session between an RF terminal and the Host. The selections are *pf1-pf24, enter, tab, baktab, clear, up_a, down_a, sysreq, e_eof, reset, noop* and *attn*.

> **Hot Key** [Toggle Field] - Default *pf1*. Using the hot key feature of the PowerNet server allows the operator to dynamically switch between active host sessions on the remote terminal. In other words, the operator can switch between an active 5250 session, a VT100 session to another host, and a VT220 session to yet another host. - All without having to logout of one system to attach to another. Up to 4 'hot' sessions can be active for a

particular terminal at any given time. Remember each active terminal session essentially uses the equivalent processing needs of another physical remote RF terminal. Therefore, if a PowerNet server is configured to handle 16 terminals and the application requires two active sessions per terminal, then only 8 'real' terminals can be used on the system at any one time.

Select the RF terminal key which must be pressed to select hot sessions between an RF terminal and the Host. The selections are *pf1-pf24, enter, tab, baktab, clear, up_a, down_a, sysreq, e_eof, reset, noop* and *attn*.

Auto Send Key [Toggle Field] This field only applies to entries that are keyed in manually and does not affect scanned data. The key selected in this field is sent automatically as a key press after the data field is filled. This key is sent regardless of the entry in the previous field. The selections are *pf1-pf24, enter, tab, baktab, clear, up_a, down_a, sysreq, e_eof, reset, attn* and *noop*. The default is *tab*

Key Click [Toggle Field] Field may be set to *on* or *off*. If *on*, terminal keyboard clicks when operated.

Case Conversion [Toggle Field] Applications may be case-sensitive or case-insensitive. Select the required case, *upper* or *lower* and all characters sent from the terminal are in that case. Select *none*, which is the default, if the application is not case sensitive.

Setup Form - Page 1
SCANNER SECTION

Send Key [Toggle Field] Select the key function that is sent to the 5250 Host after a bar code is scanned. The key is not pressed, but is entered automatically after the data, by the system. The selections are *pf1-pf24, enter, tab, baktab, clear, up_a, down_a, sysreq, e_eof, reset, attn* and *noop*. The default is *enter*. Use *noop* (no operation) when a key should not be sent.

Scan Ahead [Text Field] This field makes use of a terminal buffer that allows the operator to quickly scan and store several bar codes. The scans are then sent to the host. Enter the number of scans that can be stored. The default is 4 and the valid entries are 0 - 256. When set to *0*, the Scan Ahead feature is disabled and only one bar code can be scanned at a time.

Setup Form - Page 1
DISPLAY SECTION

Quadrant Mode [Toggle Field] The field selections are *on*, *off*, *soft*,
hard, or *lock*. Quadrants refers to the division of the terminal screen
which varies for different types of terminals. Since different terminal
types, due to their physically smaller screen sizes, can only display a
portion of the whole host presentation space at any one time, the
PowerNet server only sends to the terminal any information that can be
shown to the user. This feature makes very efficient use of the RF
bandwidth by sending only pertinent data to the remote RF terminal at any
given time. The VRC 3910, LRT 3800, and PRC 3310 quadrant areas are
shown in Figure 3-4. The windowing keys for the terminal (usually the
arrow keys) display other areas.

OFF - The default for this option is *off*. Usually *off* gives the
best view of the screen that the host is sending to the
terminal since the display on the terminal screen follows the
host input field cursor.

ON - When Quadrants is set to *on*, the terminal displays one
defined area of the full host screen at a time. If a field
crosses the boundary of quadrants, the terminal display
centers on the field as if the option was *off*. If the host
screens were designed with these divisions in mind, turning
Quadrants *on* can improve screen display.

SOFT - When this field is set to *soft*, the terminal displays
one defined area of the full host screen at a time, even if a
field crosses a boundary. Windowing keys are available to
change the display to different areas of the screen.

HARD - Setting the option to *hard*, is similar to *soft*, except
that the windowing keys are not available to change the
display.

1	2		1	2	3	4
3	4		5	6	7	8
5	6		9	10	11	12

VRC 3910 (8 line x 40 char)   LRT3800, PRC3310, 3110 (8 line x 20 char display)

Figure 3-6 Terminal Screen Quadrants

LOCK - When *lock* is selected, the display is locked into showing a certain area of the screen, which is specified with row and column coordinates. These positional coordinates define the upper left-hand corner of the display. Windowing keys are not available with this option. The **Lock Row** and **Lock Column** fields for lock coordinates are found on the second page of this form. With Quadrants set to *lock* and the **Lock Row** set to *6* and **Lock Column** set to *20*, Figure 3-5 shows the portion of the host screen displayed on the terminal screen.

Lock Row [Text Field] Applies only when quadrants is set to *lock*. Enter the row number of the Host screen where the terminal display begins.

Lock Column [Text Field] Applies only when quadrants is set to *lock*. Enter the column number of the Host screen where the terminal display begins.
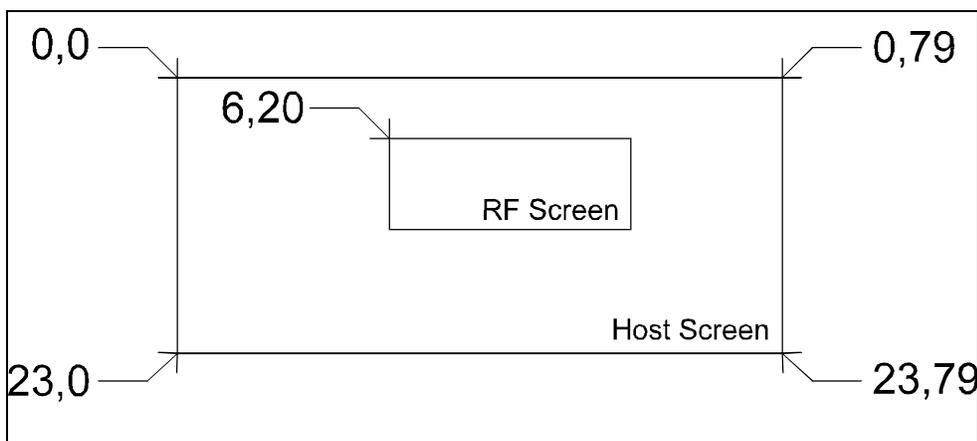

Figure 3-7 Host Screen Coordinates With RF Screen

Scroll mode [Toggle Field] The selections are full and half. Screen scrolling for up, down, left and right is controlled by this option. When *full* is selected for an 8 by 20 screen, the screen scrolls up/down 8 rows. If *half* is selected, it scrolls up/down 4 rows. For left/right, *full* scrolls 20 columns and *half* scrolls 10. The default is *full.*

Wait Message [Toggle Field] The wait message displays "Waiting for data" on the last line of the screen if the RF terminal is waiting for data or some response from the host after passing a transaction to the host. This message activity can be turned *on* or *off.*

Setup Form - Page 1
Alarm Options Group

Mode [Toggle Field] Defines the operation of the audible alarm and scanner light on the terminal. The default value is *bell*. **Off** disables the audible alarm. **Bell** Enables the audible alarm as a double beep. **Flash** Enables the scan indicator light as the alarm with no audible alarm. **Both** Enables the double beep and the scan indicator light as the alarm. **Spec1** Enables the audible alarm as a single beep. **Spec2** Enables the a single beep and the scan indicator light as the alarm.

Volume [Toggle Field] Defines the volume of the audible alarm on the terminal. Default value is *hi*.

Duration [Text Field] Defines the duration of the audible alarm on the terminal in milliseconds. The alarm mode must be set to spec1 or spec2 for duration to take effect. The default value is 150.

Frequency [Text Field] Defines the frequency of the audible alarm on the terminal in Hertz. The alarm mode must be set to spec1 or spec2 for frequency to take effect. The default value is zero (0) which represents the factory set default frequency considered to be optimum for the particular model of terminal.

Scan Duration [Toggle Field] Defines the duration of the audible alarm generated by a scan operation on the terminal, in milliseconds. The alarm mode must be set to *spec1* or *spec2* for scan duration to take effect. The default value is 300.

Frequency [Toggle Field] Defines the frequency of the audible alarm generated by a scan operation on the terminal, in Hertz. The alarm mode must be set to spec1 or spec2 for scan duration to take effect. The default value is 0 which represents the factory set default frequency considered to be optimum for the particular model of terminal. This parameter, combined with the *scan duration* parameter, allows system administrators to configure alarm sounds differently in order for users to differentiate between alarms and scan decode tones.

Allow Multiple [Toggle Field] Enables/disables the processing of multiple alarm commands generated by the host application in a single terminal update sequence. If this field is set to yes and the host sends down multiple bells on a screen, the alarm on the terminal beeps as set for each of the bell commands. If this field is set to no, the bells are combined and the terminal only gives one alarm. The default value is *yes*.

Setup Form - Page 1
PRINTER SECTION

Type [Toggle Field] This field is where the printer type is selected. Please match this filed with the desired printer type. Allowable printer types at the time of this writing are *none*, *ps1000*, *ps1001*, *ps1004*, *monarch*, *pddumb*, *comtec*, and *rascal*.

Init Object [Toggle Field] This field contains the file name used for printer trouble shooting or printer initialization. This field toggles through any available printer initialization files that may exist on the PowerNet server. It is even possible that for trouble shooting, a file could contain the actual target printer commands to print a test label. When WHIP is booted it sends the contents of the files, as is, to the printer. This is useful to insure the proper printer type is selected, the cabling is correct and the printer is functional. It can also be used to send printer setup commands to the printer if needed. Unless this *object* is used for printer initialization, this entry should be removed or it causes a test label to be sent every time the terminal is re-booted.

> CAUTION: This file must be in the exact image that the printer requires. As an example some printer requires a Carriage Return and Line feed to end printer commands. If this file was created using a UNIX editor, each line only contains a line feed and not the carriage return. For additional information regarding printer commands, please reference the programming manual of the printer.

> > **Flag Byte** [Text Field] This is the byte used as the signal byte for printing. The presentation space of each screen from the host is examined for this byte (a decimal ASCII value as converted from the EBCDIC value). It signals that the data following is printer data rather than screen data. The starting byte location is defined in the following *Flag Row* and *Flag Column* handler options.. After the *Flag Byte*, the handler searches the data stream for another flag byte to signal the end of the print data. In other words, the data encapsulated between the two *Flag Bytes* is sent to the printer. The selection of the flag byte should be a byte which does not normally occur within the host application or contained within the print data.

Flag Row [Text Field] This is the row where the flag byte starts. *Flag Row* allows the software to narrow its search for the flag byte. CAUTION: This is a zero based number where the lowest row (top of the screen) is zero.

Flag Column [Text Field] This is the Column number for the flag byte. CAUTION: This is a zero based number where the lowest row (leftmost side of the screen) is zero.

Clear Key [Toggle Field] Once printing is completed, this key is sent to the host application to signal that the printer has completed the printing of the label. This insures the printer is not instructed to print another label before finishing printing the current label. The selections are *pf1-pf24, enter, tab, baktab, clear, up_a, down_a, sysreq, e_eof, reset,* and *attn*. The default is *noop.*

Setup Form - Page 1
FORMATTER SECTION

Object [Toggle Field] If the Formatter option is installed on the PowerNet server, select the name of the Formatter object if one has been created for the particular handler/application being configured. It contains the final formatted screens which are sent to the RF terminals. This object is created with the *Screen Formatter* package.

Alt. Key [Toggle Field] This field is for use in conjunction with the *Screen Formatter*. When using this package, a key function, other than the *Standard Key*, can be sent to the 5250 Host after a bar code is scanned. Therefore, a choice of two keys, which can be used selectively, exists with the *Formatter.* The selections for the second key are *pf1-pf24, enter, tab, baktab, clear, up_a, down_a, sysreq, e_eof, reset, attn* and *noop* (no operation). The default is *tab*. Use *noop* (no operation) when a second key is not used.

Setup Form - Page 1
DIALOG SECTION

Object [Toggle Field] The *Dialog Object* is the file name given to the *Dialog Script* that is executed when this option is selected from the *Host List* on the RF terminal. A default script, *DFLT* is used for *Quick Setup* operation. If a custom *Dialog Script* has been written, and the script is available on the PowerNet server, the script name appears on the selectable list.

Setup Form - Page 1
TIMERS SECTION

Radio [Text Field] Enter the amount of time, in seconds, that the RF terminal remains on, while there is no response from the host. When the timer expires, and the host has not responded, the terminal is powered off. The default is 120 seconds. The value 0, turns this timer off.

Power [Text Field] Enter the amount of time, in seconds, that the RF terminal remains powered on when there is no user activity. When the timer expires, the terminal is powered off. The default is 300 seconds. The value 0, turns this timer off.

Backlight [Text Field] Enter the amount of time, in seconds, that the RF terminal has backlighting on the screen, once it is triggered by a key press or scan. When the timer expires, the backlighting on the screen is turned off. The default, 0, turns this timer off and the lamp is activated by pressing the <func><l> keys on the terminal to activate the backlight.

Setup Form - Page 1
TN5250 SECTION

Host Number [Toggle Field] In configuring the host connection parameters in the TN5250 environment, each host connection setup is assigned a host number. This particular field allows the operator to select the particular host connection that the handler attaches to when selected.

Setup Form - Page 2
KEYBOARD SECTION

Mapping Object [Toggle Field] Key mapping control can be selected from a list keyboard mapping object created using the key map object editors available in the *Object Editors* menu. Use the *Key Mapping Object Utility* to change the RF terminal key that performs the function of the standard 5250 key.

NOTE: Key mapping is designed to be used with Symbol RF terminals that have 5250 keyboard overlays. See *Chapter 1* for ordering information.

Allow Cursor [Toggle Field] This field, when set to *yes*, allows the user to move outside the boundary of an input field. In some 5250 applications, developers can set sub file fields that allow the 5250 terminal to perform roll-up and roll-down functions. Pressing the <left> or <right> arrow keys in this mode allow the user to page around on the terminal screen.

Setup Form - Page 2
 SCANNER SECTION

Length Check [Toggle Field] Enables/disables local terminal field length checking. A value of *on* causes an error message to be generated locally be the terminal if scanned input is greater than the length of the field, or if an attempt to enter a non-control key (enter, tab, arrows, function keys, etc.) is made after the field is filled. A value of *on* also disables *Auto Send* key operation (See Keyboard Options Group) and the Truncation option (see below). The default value is *off*.

Truncation [Toggle Field] Enables/disables truncation of scanned inputs to the length of the input field. This option is not applicable if the Length Check option is set to *on*. A value of *on* also disables field wrapping. The default value is *off*. For example, if *off* is selected and the length check option is set to *off*, and 12 characters are scanned for entry into a form with three fields that are 4, 3, and 5 characters in length, the scanned data is then distributed across these fields.

Stripping [Toggle Field] Strips trailing spaces and/or underscore characters from scanned input. The default value is *off*. The options are *i*, *space*, *score*, and *both*. Allowable parameters for this field are *off, space, score,* and *both*.

Binary-128 [Toggle Field] Enables/disables the processing of binary code 128 bar codes on the terminal. The default value is *off*.

Setup Form - Page 2
SCANNER OBJECTS SECTION

Data Mapping [Toggle Field] Selects a previously defined data mapping object that describes how scanned input is mapped. The file name is <object>**.sdm** and is selected from files that exist on the controller. An example follows generated by the object editor:

```
# Sample scanner data mapping object
#
#BARCODE SCANNED=AID Key Sent;
#If you scan ROZ PowerNet sends a tab key to the application.
#
JEFF=enter;
JENNIFER=PF1;
CHARLES=PF2;
ROZ=tab;
GREG=PF24;
```

Data Editor Defines the object that describes how scanned input is edited prior to delivery to the host. The object is created by the Scan Editor utility program (*scedit*). File is <object>**.sce**.

Decoder Control Defines object describing how the symbology decoder on the scanner functions. The file name is <object>**.sdc** which is created with the object editor available on the *Object Editors* selection off the main menu.

Setup Form - Page 2
DISPLAY SECTION

Mapping Object Display character mapping object file created with the object editor function from the main menu having the file name <object>**.dcm**.

Language Defines the character set used for terminal error message displays. The default value is *english*. Allowable parameters for this field at the time of this writing are *english, french, german, spanish,* and *italian*.

Reverse Video [Toggle Field] Enables/disables the display of the reverse video attribute on the terminal display. The screen display of the RF terminal can appear as either normal (dark text on a light background) or reverse (light text on a dark background) video provided that the reverse video attribute is used. The default value is *on*.

Default Data [Toggle Field] This field can be toggled to *on* or *off*. The default is *off*. When this field is *on*, all data present in the field, including blanks, are transmitted to the RF terminal. The data can then be edited locally on the terminal. If this field is set to off, the field appears as underscores, regardless of what the host is supplying.

Cursor [Toggle Field] The appearance of the cursor on the terminal can be set. A *hard* cursor appears as a solid one-character block while a *soft* cursor is an up or down arrow indicating case. Select *hide* to remove the cursor from the screen. The default is *hard*.

Double High [Toggle Field] Enables/disables double high display of characters on the terminal. Default value is *no*.

Double Wide [Toggle Field] Enable/disables double wide display of characters on the terminal. Default value is *no*.

Setup Form - Page 2
ALARM SECTION

Alternate: [Toggle Field] This option allows the host application to place a single digit display character at a specified row and column within the presentation space for conversion to the indicated number of alarms at the terminal. Default value is *no*.

Row: [Text Field] When alternate (above) is set to *yes*, this parameter specifies the zero relative row number in the host presentation space where the alternate alarm digit is found.

Column: [Text Field] When alternate (above) is set to *yes*, this parameter specifies the zero relative column number in the host presentation space where the alternate alarm digit is found.

Setup Form - Page 2
RF POLLING SECTION

Initial [Text Field] RF terminals running **whip500.HEX** use polling as a method of communication with the transceiver. This operation places overhead on the terminal battery thus the poll rate is a factor in determining battery life. The faster the poll rate, the sooner the battery needs recharging. Two rates, and when to switch to them, can be set (see the next two fields). The *initial* poll rate is faster than the *final* poll rate, as it is used when the terminal begins operation and a urgent to establish communication exists. This rate can then be modified to be relatively faster or slower within its rate boundaries by entering a value in this field. Valid entries are from 1-32, with 1 being the fastest poll rate within this very fast rate interval, and 32 being the slowest. The default is 1.

Final [Text Field] This rate interval has rates slower than the initial poll rate. The rate can be further adjusted by entering a value from 1-32 as in the previous field. The value 1 gives you the shortest battery life, while 32, the default, gives the longest.

Switch [Text Field] This field also affects battery life in that the longer the initial poll rate is used, the more overhead on the battery. Enter the number of seconds after which polling ceases taking place at Poll Rate 1 and commences at the final poll rate. The default is 10 seconds and valid entries are from 1-99.

Setup Form - Page 2
AP POLLING SECTION - *For Access Point Terminals only*

Primary/Min [Text Field] Defines the initial beacon poll rate between polls immediately following an RF transmission from the terminal to the host or when there is network traffic. This operation places overhead on the terminal battery and the Poll Rate is a factor in determining battery life. The faster the poll rate, the sooner the battery needs recharging. The default value is 2 (200 milliseconds).

Max [Text Field] Only applies if an algorithm is chosen. This field defines the maximum poll rate, in 100ms increments, between polls a after an RF transmission from the terminal to the host that only applies if a polling algorithm is applied. The default value is 0.

Algorithm [Text Field] The Algorithm field defines the access point beacon algorithm that the terminal uses. Beacons are broadcast every 100ms, so a value of 1 selects 10 polls per second. When the field is set to 0, it uses the value set in *Primary/Min* as the poll rate. 1 provides best performance where 10 provides the best power saving. A value of 11 or above selects a dynamic algorithm that varies from the value set in the *Primary/Min* field to the *Max* fields as defined above. When set to 11, the terminal uses the *Primary/Min* value as the beacon poll rate when there is network traffic for the terminal and *Max* as the rate when there is none. Default is 0. Value should not exceed the manufacturer's recommended value.

Setup Form - Page 2
RELOCATION SECTION

Source Defines the starting row (zero-based) in the host display that is relocated to the Destination row of the host display. The default value is zero (0).

Destination Defines the starting row (zero-based) in the host display where the starting Source row is located. The default value is zero (0).

Row Count Specifies the number of host display rows to be relocated, starting with the row defined by the Source option and continuing from top to bottom of the display. A value of 0 disables row relocation, which is the default.

Move Blank Enables/disables row relocation based on the absence of non-blank data in the host display area to be relocated. Blank data is defined as null or space characters. The default value is *no*.

Setup Form - Page 2
KEEPALIVE SECTION

The next field refers to the *Keepalive* functions. Some 5250 installations may have an inactivity timer to deactivate the session of an idle RF terminal. While this is appropriate for hard-wired terminals, it not be desirable for RF terminals. This inactivity is measured by terminal activity. It looks for a period of time where there has been no entry. The *Keepalive* function allows you to defeat this inactive timer. It sends a key of choice to the host at some regular interval if there has been no terminal activity. The time of the auto key entry should be less than the host time out value.

Minutes [Text Field] This timer is used to defeat RF terminal connection timeouts by having the PowerNet server send a

keystroke to the host. This keystroke appears to be from the terminal and keeps the session with the terminal alive. Normally, a terminal session with the host is terminated if there is no notification within a specific time interval. The Host System Administrator should supply this timeout interval. Valid data entries are 0-99 minutes. The default, 0, turns this timer off.

Send Key [Toggle Field] Specifies the key that is sent to the host after Minutes of inactivity. The default value is *noop* which disables the *keepalive* function.

Setup Form - Page 2
LOG LEVELS SECTION

The six fields under the term *Log Levels* on the *5250 Handler Setup Form* control levels of information collected by the **RF Log** for various parameters. There are 10 log levels, from 0 to 9, with a level of 9 collecting the most information. Levels of 6 or greater gives hex dumps where appropriate. For all the listed items, a level of zero turns the feature off and no information is collected.

General [Toggle Field] Refers to general log events such as startup and shutdown. The default is 1.

Display [Toggle Field] Refers to the 5250 full screen 24 by 80 character Presentation Space information. The default is zero.

Formatter [Toggle Field] Refers to the *Screen Formatter* information. The default is zero.

Standard [Toggle Field] This field can be toggled to *on* or *off*. The default is *on*. When *on*, any alarm programmed for the host screen sounds and/or flashes, and when *off*, does not. For each full 5250 host screen, one alarm may be used.

Dialog [Toggle Field] Refers to Dialog Script information. Default is zero.

Datastream [Toggle Field] Refers to the logical unit protocol debugging information of the data stream. The default is zero.

SNA [Toggle Field] Refers to SNA packet information. The default is zero.

Setup Form - Page 3
KEYBOARD SECTION

Clear First [Toggle Field] Enables/disables local clearing of the input field by the terminal with the strike of the first non-control key. The default value is *off*.

Setup Form - Page 3
DISPLAY SECTION

Show Prompt [Toggle Field] Enables/disables local underlining of the input field at the terminal. The default value is *off*.

Setup Form - Page 3
PRINTER SECTION

Start [Text Field] Specifies a character sequence that, when encountered in the host display area, indicates that all subsequent characters up to but not including the End character sequence are to be transmitted to the printer attached to the terminal. The default value is blank which also indicates that this option is not in use.

End [Text Field] Specifies a character sequence that terminates collection of data from the host display area for transmission to the printer attached to the terminal. The default value is blank which also indicates that this option is not in use.

Start Convert [Text Field] Specifies a character sequence within the print data collected with the Start and End options that indicates the subsequent character pairs are hexadecimal values that are converted to binary. A blank value indicates that this option is not in use, which is the default. The default value is blank which also indicates that this option is not in use.

End Convert [Text Field] Specifies a character sequence that terminates binary conversion. The default value is blank which also indicates that this option is not in use.

Setup Form - Page 3
VT100 EXTENSION SECTION

Start [Text Field] Specifies a character sequence that, when encountered within the host display, indicates that all subsequent characters up to but not including the End sequence, are to be interpreted as VT100 Extended Commands (see Tech Note 9999). The default value is blank which indicates that the option is not in use.

End [Text Field] Specifies a character sequence that terminates the VT100 Extended Command.

Press <Esc> to save the *Host List Setup Form* and return to the *SDLC/TR Network Menu*.

5250 Terminal Emulator

This option provides full screen, 24 by 80, 5250 terminal emulation. It can be run from either the service or dialup modem port. It is useful for verifying the initial installation and for developing Dialog Scripts.

Select *Emulator* from the *SDLC/TR Network Menu* and a prompt, for the LU that are used for establishing a session with the Host, appears. Enter the number of an *IDLE* LU. See *Status* on Page 2-14. The Host logon or screens (depending upon the script, etc.) appears on the terminal.

IF the LU number that Is entered has not been defined as ACTIV, the Host returns the message "INACTIVE". If the Host system defined the LU as something other than a 3278 Model 2 with a 24 by 80 presentation space, a "SESSION BIND" failure message is returned. Other emulator startup errors may require analysis using the *Line Trace Facility* (see Page 3-17).

The emulator provides the following keyboard translations to accommodate non-5250 keyboards:

Control Keys	Action
<CTRL><Y>	Help
<CTRL><D>	PS Information
<CTRL><X>	Exit
<CTRL><E>	Escape to UNIX Shell
<DELETE>	Abort

5250 AID Key Mapping	Function
<TAB>	Tab
<ESC><TAB><ENTER>	Backtab
<ESC><C><ENTER>	Clear
<ESC><E><ENTER>	EOF (clear to end of field)
<ESC><1-24><ENTER>	PF1-24
<ESC><P><1-3><ENTER>>	SYSREQ
<ESC><S><ENTER>	

LU Mapping

The mapping of LUs to terminals can be changed with this option. When it is selected from the *SDLC/TR Network Menu*, the *LU Mapping Form* shown in Figure 3-7 is displayed.

```
                          SNA LU Session Mapping
```

```
   CONTROLLER LU   TERM        CONTROLLER LU   TERM        CONTROLLER LU    TERM
   SD-1   5250 2   [65  ]      SD-1   5250 18  [81  ]
   SD-1   5250 3   [66  ]      SD-1   5250 19  [82  ]
   SD-1   5250 4   [67  ]      SD-1   5250 20  [83  ]
   SD-1   5250 5   [68  ]      SD-1   5250 21  [84  ]
   SD-1   5250 6   [69  ]      SD-1   5250 22  [85  ]
   SD-1   5250 7   [70  ]      SD-1   5250 23  [86  ]
   SD-1   5250 8   [71  ]      SD-1   5250 24  [87  ]
   SD-1   5250 9   [72  ]      SD-1   5250 25  [88  ]
   SD-1   5250 10  [73  ]      SD-1   5250 26  [89  ]
   SD-1   5250 11  [74  ]      SD-1   5250 27  [90  ]
   SD-1   5250 12  [75  ]      SD-1   5250 28  [91  ]
   SD-1   5250 13  [76  ]      SD-1   5250 29  [92  ]
   SD-1   5250 14  [77  ]      SD-1   5250 30  [93  ]
   SD-1   5250 15  [78  ]      SD-1   5250 31  [94  ]
   SD-1   5250 16  [79  ]      SD-1   5250 32  [95  ]
   SD-1   5250 17  [80  ]      SD-1   5250 33  [96  ]



                       <ESC>=QUIT   <ARROWS>=MOVE
```

Figure 3-7 LU Mapping Form

To change the terminal assigned to a particular LU, enter the terminal number in the bracketed field to the right of the LU. When changing assignments, you may wish to check the state of the LU first. Only *ACTIV* and *IDLE* LUs should be used.

When the form is complete, press <Esc> and a prompt to save the changes appears.

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Appendix   Sample System Generation

This appendix contains sample system generation which can be used to define the Connect NCU to the IBM host system, (e.g., AS/400, S/3x, etc). The NCU emulates up to sixteen 5294 IBM cluster controllers each capable of supporting up to 8 attached workstation devices (RF terminals). The NCU supports serial (RS232) attachment as well as Token Ring and Etherenet connection and sample sys-gens are provided for reference. There are many ways that systems can be configure and Symbol strongly recommend that the user refers to the appropriate host documentation in case of doubt. (Note, the * symbol indicates a default value). Highlighted entries in the tables should match the configuration of the NCU.

SDLC Line Description Parameters

Name	Parameter	Value
Line description	LIND	The name you give the line.
Option	OPTION	*BASIC
Category of line		*SDLC
Resource name	RSRCNAME	The unique name of this host communications port.
Online at IPL	ONLINE	*YES (or *NO)
Data link role	ROLE	*PRI (Primary)
Physical interface	INTERFACE	*RS232V24 (or *V35)
Connection type[1]	CNN	*NONSWTPP (or *MP or *SWTPP)

[1] This parameter depends upon the number of cluster controllers the NCU is emulating. If only one is enabled then the NSWTPP may be appropriate, (or SWTPP if operating over a dial-up telephone line) , if more than one then use the MP (multi-point) setting.

Name	Parameter	Value
Switched network backup	SNBU	*NO (or *YES)
Vary on wait	VRYWAIT	*NOWAIT
Auto call unit	AUTOCALL	*NO
Attached non-switched ctrlr	CTL	Name of controller attached to this line.
Exchange identifier	EXCHID	*SYSGEN
NRZI data encoding	NRZI	*YES (or *NO)
Maximum controllers	MAXCTL	The number of controllers supported by this line.
Clocking[2]	CLOCK	*MODEM
Line speed	LINESPEED	9600
Modem type supported	MODEM	*Normal
Modem data rate select	MODEMRATE	*Full
Switched connection type	SWTCNN	*Both
Auto answer	AUTOANS	*Yes (or *No)
Auto dial	AUTODIAL	*No (or *Yes)
Dial command type	DIALCMD	*None
Calling number	CALLNBR	*None
Station address	STNADR	Only required if CNN = *SWTPP

Name	Parameter	Value

---

[2] This setting will require either a modem or a modem eliminator to provide data clocking on the host line. Using this setting means that other parameters such as line speed are irrelevant.

Connect poll retry	CNNPOLLRTY	7
Maximum frame size	MAXFRAME	521
Error threshold level	THRESHOLD	*Off
Duplex[3]	DUPLEX	*Full (or *Half)
Modulus	MODULUS	8
Max. outstanding frames	MAXOUT	7
Nonproductive Rec. timer	NPRDRCVTMR	320
Idle timer	IDLTMR	30
Connect poll timer	CNNPOLLTMR	30
Poll cycle pause	POLLPAUSE	0
Frame retry	FRAMERTY	7

---

[3] When CNN = *MP (multi-point), then Half duplex operation is mandatory.

5250 Token-Ring Line Description Parameters

Name	Parameter	Value
Line description	LIND	The name you give the line.
Option	OPTION	*BASIC
Category of line		*TRLAN
Resource name	RSRCNAME	Unique name of this host communications port.
Online at IPL	ONLINE	*YES (or *NO)
Vary on wait	VRYWAIT	*NOWAIT
Maximum controllers	MAXCTL	Number of controllers supported by this line.
Line speed[4]	LINESPEED	*16M (or *4M)
Maximum frame size	MAXFRAME	1994
TRLAN manager log level	TRNLOGLVL	*Off
Current logging level		*Off
TRLAN manager mode	TRNMGRMODE	*Observing
Log configuration changes	LOGCFGCHG	*Log
Token-ring inform of beacon	TRNINFBCN	*Yes
Local adapter address[5]	ADPTADR	12 digit MAC address.
Exchange identifier	EXCHID	*SYSGEN
Early token ring release	ELYTKNRLS	*No
Error threshold level	THRESHOLD	*Off
Text	TEXT	Optional information you give about this line.

---

[4] Token Ring networks operate at either 16Mbps or 4Mbps. Once the speed has been configured only devices operating at that speed must be connected to the network, otherwise the network will crash.

[5] 12 digit hexadecimal MAC address of IBM host network adapter card or some arbitrary override value.

5250 Ethernet Line Description Parameters

Name	Parameter	Value
Line description	LIND	Name you give the line.
Option	OPTION	*BASIC
Category of line		*ELAN
Resource name	RSRCNAME	The unique name of this host communications port.
Online at IPL	ONLINE	*Yes (or *No)
Vary on wait	VRYWAIT	*NOWAIT
Network controller	NETCTL	*ETHERNET
Local adapter address	ADPTADR	12 digit MAC address.
Exchange identifier	EXCHID	*SYSGEN
Ethernet standard	ETHSTD	*ETHV2
Maximum controllers	MAXCTL	Number of controllers supported by this line.
Error threshold level	THRESHOLD	*Off
Text	TEXT	Optional information you wish to give about this line.

Remote Workstation Controller Description Parameters (SDLC)

Name	Parameter	Value
Controller description	CTLD	Nme you give the controller.
Controller type	TYPE	5294
Controller model	MODEL	1
Link type	LINKTYPE	SDLC
Online at IPL	ONLINE	*YES
Switched line	SWITCHED	*NO (or YES)
Short hold mode	SHM	*No
Switched network backup	SNBU	*No (or Yes)
Attached NSWTPP line name	LINE	Name of line if non-switched
Switched line list	SWTLINLST	Specify only if *switched* line.
Attached device names	DEV	Devices in *Device Description* table.
Character code	CODE	*EBCDIC
Device wait timer	DEVWAITTMR	120
Exchange identifier	EXCHID	05F000xx (for 5294, where xx = Cntrlr Stn Addr).
Initial condition	INLCNN	Specify only if *switched* line
Switched connection number	CNNNBR	Specify only if *switched* line
Pre-dial delay	PREDIALDLY	Specify only if *switched* line
Redial delay	REDIALDLY	Specify only if *switched* line
Dial retries	DIALRTY	Specify only if *switched* line
Station address	STNADR	(Typically 5294s use a Stn Addr above 50.)
SDLC poll priority	POLLPTY	*NO (or perhaps YES if CNN = MP)
SDLC poll limit	POLLLMT	Specify only for *multipoint*
SDLC connect poll retry	CNNPOLLRTY	*CALC for SWTPP, NOMAX for NSWTPP
SDLC NDM poll timer	NDMPOLLTMR	*CALC
Recovery limits	CMNRCYLMT	SYSVAL
Authority	AUT	*LIBCRTAUT
Text	TEXT	Description of the controller and its location

Remote Workstation Controller Description Parameters

(LAN - Token-Ring or Ethernet)

Use auto-configure feature to define remote workstation controller for LAN attachment.

5250 Device Description Parameters

Name	Parameter	Value
Device description	DEVD	Name you give the device.
Device class	DEVCLS	RMT
Device type	TYPE	5251
Device model	MODEL	11
Local location address	LOCADR	(00 through 07 for each 5294 controller)
Online at IPL	ONLINE	*Yes (or No)
Attached controller name	CTL	Controller name to which this device is connected.
Keyboard language type	KBDTYPE	*SYSVAL
Drop line at signoff	DROP	No
Character identifier	CHRID	*KBDTYPE
Allow blinking cursor	ALWBLN	*Yes
Authority	AUT	*Change (or All or Use or Exclude)
Text	TEXT	You insert a description of the device and its location

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